

INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 2002	Park: Shenandoah NP
Principal Investigator: Dr Richard Tollo	Office Phone: (202)994-6960 Email: rtollo@gwu.edu
Address: George Washington University Department of Earth and Environmental Sciences Washington, DC 20052 US	Office Fax: (202)994-0450
Additional investigators or key field assistants (first name, last name, office phone, office email): No co-investigators	
Permit#: SHEN-2001-SCI-0011	
Park-assigned Study Id. #: SHEN-00133	
Project Title: GEOLOGIC EVOLUTION OF MESOPROTEROZOIC BASEMENT, BLUE RIDGE PROVINCE, SHENANDOAH NATIONAL PARK, VIRGINIA	
Permit Start Date: Mar 15, 2001	Permit Expiration Date Dec 31, 2010
Study Start Date: Jul 01, 1996	Study End Date Dec 31, 2010
Study Status: Continuing	
Activity Type: Research	
Subject/Discipline: Geology / General	
Objectives: <p>The primary objective of this study is the determination of detailed geologic, petrologic, and geochronologic relationships characterizing metamorphic and igneous basement rocks of Mesoproterozoic age exposed in the Blue Ridge geologic province within Shenandoah National Park. The project involves detailed field mapping and an integrated program of petrographic, geochemical, and isotopic analyses designed to elucidate petrologic and temporal aspects of the Grenville orogeny.</p>	
Findings and Status: <p>During the past year, progress in this research project includes: (1) expanded field mapping and sampling of geologic units, (2) petrographic analysis of thin section samples, (3) major- and trace-element geochemical analyses of selected whole-rock samples, (4) detailed analysis of mineral chemical compositions in representative rocks and (5) U-Pb isotopic analyses of zircons from one of the mapped lithologic units. Field mapping, undertaken both within the Park and in contiguous adjoining areas, has elucidated the areal extent and mutual geologic relationships of basement rocks in the Thornton Gap, Old Rag Mountain, Fletcher, and Chester Gap 7.5-minute quadrangles. The mapping has demonstrated the existence of ten major lithologic units including different types of charnockite, various gneisses, and leucocratic granitoids. New isotopic analyses of four lithologic units have delineated the timing relationships of geologic events in the area collectively spanning an interval of 100 m.y. These geologic events, which collectively define the Grenville orogeny in the northern Blue Ridge province, include at least three periods of magmatism and a major period of deformation and metamorphism. These newly established relationships constitute the first detailed chronology of Grenville-age orogenesis based on integrated studies involving field, petrologic, and isotopic investigations. Studies planned for 2003 include: (1) continued field mapping and petrographic analysis of rocks in the northern part of the study area, (2) major- and trace-element geochemical analyses of additional whole-rock samples and (3) U-Pb isotopic analyses of zircons from key lithologic units.</p> <p>It is anticipated that this research project will become part of a collaborative effort involving scientists from the U.S. Geological Survey and Virginia Division of Mineral Resources designed to produced multi-disciplinary resource maps for Shenandoah National Park. A major product from this research will be a new geologic map of the National Park, supported by new field and analytical data.</p>	

For this study, were one or more specimens collected and removed from the park but not destroyed during analyses? Yes	
Funding provided this reporting year by NPS: 0	Funding provided this reporting year by other sources: 0
Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college	
Full name of college or university: n/a	Annual funding provided by NPS to university or college this reporting year: 0